

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR					Implement- ation Horizon	Analyze As Part of 2020 Study	C/CAG Staff Comments
Potential Improvements	Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
Highway 101							
1	Auxiliary Lanes from Embarcadero to Shoreline <ul style="list-style-type: none">• Include flood control enhancements at creek crossings	<ul style="list-style-type: none">• Result is continuous auxiliary lanes through corridor• Improve traffic operations• Preserve existing over crossings• Stay within existing right-of-way (may require some design exceptions)• Improve on/off ramps• Minimal environmental impacts	<ul style="list-style-type: none">• Limited increase in corridor capacity• Reduced shoulder width impacting safety and availability of accident removal to shoulder• Increase surface area and runoff during storms		Medium	Long	High
	ITS <ul style="list-style-type: none">• Install additional CCTV cameras to provide full coverage along 101• Install CMS in both directions near Shoreline• Install, upgrade or replace communications and vehicle detection infrastructure to provide reliable hardwire communications	<ul style="list-style-type: none">• Completes recommended camera coverage• Construction costs will be lower if joined with other construction	<ul style="list-style-type: none">• ITS elements are the first to be cut from construction projects• Trailblazer signs are not used in the Bay Area so there would need to be education as well		Low		

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	<ul style="list-style-type: none"> Install trailblazer signs near exit ramps to direct vehicles off freeway to an alternate route 							
2	Reconstruct Embarcadero/Oregon interchange	<ul style="list-style-type: none"> Improve traffic operations Increase capacity of interchange/relieve local street congestion Provide room for freeway widening 	<ul style="list-style-type: none"> No increase in corridor capacity May require design exceptions (or added right-of-way) 	<ul style="list-style-type: none"> Right-of-way 	High	Long	Low	
	<p>ITS</p> <ul style="list-style-type: none"> Consider arterial CMS to provide freeway traffic flow info Consider trailblazers on arterial to redirect traffic during incidents Install CCTV camera(s) on arterial Install communications infrastructure in bridge structure Replace, upgrade, or install vehicle detection 	<ul style="list-style-type: none"> Completes recommended camera coverage Construction costs will be lower if joined with other construction Arterial guide signs will keep drivers from getting on the freeway where severely congested. Trailblazers can help guide drivers on arterials around an incident on the freeway. Infrastructure in bridge will provide significant savings if done when bridge is constructed as opposed to subsequent installation. Better for aesthetics too. 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects Trailblazer signs are not used in the Bay Area so there would need to be education as well 	<ul style="list-style-type: none"> 				
3	Reconstruct San Antonio interchange	<ul style="list-style-type: none"> Improve traffic operations Increase capacity of 	<ul style="list-style-type: none"> No increase in corridor capacity 	<ul style="list-style-type: none"> Right-of-way 	Medium	Long	High	This project ties in and

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	and eliminate southbound on ramp at Charleston	<ul style="list-style-type: none"> interchange/relieve local street congestion Provide room for freeway widening Add southbound on-ramp 	<ul style="list-style-type: none"> Limited right-of-way May require design exceptions (or added right-of-way) 					supports the VTA's Rt. 85/101 project.
	ITS <ul style="list-style-type: none"> Consider arterial CMS to provide freeway traffic flow info Consider trailblazers on arterial to redirect traffic during incidents Install CCTV camera(s) on arterial Install communications infrastructure in bridge structure Replace, upgrade, or install vehicle detection 	<ul style="list-style-type: none"> Provides camera coverage on arterial Construction costs will be lower if joined with other construction Arterial guide signs will keep drivers from getting on the freeway where severely congested. Trailblazers can help guide drivers on arterials around an incident on the freeway. Infrastructure in bridge will provide significant savings if done when bridge is constructed as opposed to subsequent installation. Better for aesthetics too. 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects Trailblazer signs are not used in the Bay Area so there would need to be education as well 	<ul style="list-style-type: none"> 				
4A	Widen freeway to 10 lanes (County Line to Shoreline)	<ul style="list-style-type: none"> Increase capacity 	<ul style="list-style-type: none"> Requires reconstruction of 4 interchanges including Shoreline 	<ul style="list-style-type: none"> Right-of-way 	Very high	Long	Medium	
4B	Widen freeway to 10 lanes + Aux Lanes (County Line to Shoreline)	<ul style="list-style-type: none"> Increase capacity and improve traffic operations 	<ul style="list-style-type: none"> Requires reconstruction of 4 interchanges including Shoreline Requires additional right-of-way 	<ul style="list-style-type: none"> Right-of-way 	Very high	Long	Low	

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5	Widen freeway to 10 lanes + Aux Lanes (Whipple to County Line)	<ul style="list-style-type: none"> • Increase capacity + improve traffic operations 	<ul style="list-style-type: none"> • Requires reconstruction of 4 interchanges • Requires additional right-of-way 	<ul style="list-style-type: none"> • Right-of-way 	Very high	Long	Low	
	<i>ITS (for 4 and 5)</i> <ul style="list-style-type: none"> • Provide additional vehicle detection • Install additional CCTV cameras to provide full coverage along 101 • Install CMS in both directions at both ends of project • Install, upgrade or replace communications infrastructure to provide reliable hardwire communications (including across interchange bridge structures) • Install trailblazer signs near exit ramps to direct vehicles off freeway to an alternate route • Install trailblazer signs on arterials to redirect traffic before 	<ul style="list-style-type: none"> • Completes recommended camera coverage • Provides camera coverage on arterial • Construction costs will be lower if joined with other construction • Arterial guide signs will keep drivers from getting on the freeway where severely congested. Trailblazers can help guide drivers on arterials around an incident on the freeway. • Infrastructure in bridge will provide significant savings if done when bridge is constructed as opposed to subsequent installation. Better for aesthetics too 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects • Trailblazer signs are not used in the Bay Area so there would need to be education as well • Trailblazers should be installed as a complete system (or full route) as opposed to discontinuous segments 	<ul style="list-style-type: none"> • 	Low			

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	<i>it enters the freeway</i> <ul style="list-style-type: none"> Install CCTV cameras on arterials at all interchanges 							
6	Build elevated lanes above 101 from Woodside Road to 85/101 North project conform <ul style="list-style-type: none"> Consider mixed-flow lanes or HOV/HOT lanes NOTE: similar project profiled in Civil Engineering in June 2004 	<ul style="list-style-type: none"> Increase capacity without adding right-of-way Allow “express” service between key destinations Separate thru traffic from local traffic 	<ul style="list-style-type: none"> Visual impact to adjacent communities Very difficult construction staging and impacts Limited access to elevated section 	<ul style="list-style-type: none"> Constructability 	Very high	Long	High	
	ITS <ul style="list-style-type: none"> Install CCTV cameras on elevated section for surveillance Install or relocate CMS in advance of elevated section to assist with decision making Install communications conduit inside bridge structures Install vehicle detection 	<ul style="list-style-type: none"> Camera coverage on elevated section Ability to provide traveler information on signs before decision is made to use elevated section Construction costs will be lower if joined with other construction 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> 				

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7	Improve local access across 101	<ul style="list-style-type: none"> Relieve freeway from some local traffic Reunite communities on each side of freeway Reduce local and neighborhood congestion 	<ul style="list-style-type: none"> Limited right-of-way for new over crossing touchdowns "Not in my backyard" adversity to new connections If improvement not proportional, may increase traffic at other locations Resultant redistribution or increase in traffic in areas outside study boundaries 	<ul style="list-style-type: none"> Right-of-way 	Low to Medium High	Long	Low	
	<i>ITS</i> <ul style="list-style-type: none"> Install lane control signals in tunnel Install CCTV camera to monitor gate operation 	<ul style="list-style-type: none"> Lane control signals are beneficial when there is an accident in tunnel Surveillance will help monitor proper functioning of gate 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> 				
Dumbarton Bridge to Highway 101						Implementation Horizon	Analyze As Part of 2020 Study	C/CAG Staff Comments
8	Grade separations at Bayfront/Willow and Bayfront/University	<ul style="list-style-type: none"> Improve throughput Increase capacity and improve traffic operations on Bayfront Expressway Quicker connections to Willow and University Provide uninterrupted flow, thereby increasing capacity for all travel directions at 	<ul style="list-style-type: none"> Environmental impacts Limit local access to wetlands Minimal benefit if University land uses immediately north and/or south of Bayfront/Willow not improved Impacts during 	<ul style="list-style-type: none"> Spacing for RR and Sun Microsystems campus difficult at Bayfront/Willow Environmental impacts, especially at 	Medium High	Long	High	

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		Bayfront/University	construction staging due to limited right-of-way	the Bayfront/University intersection				
	ITS <ul style="list-style-type: none"> • Install vehicle detection • Install CCTV camera(s) on arterials • Install communications infrastructure in bridge structure 	<ul style="list-style-type: none"> • Construction costs will be lower if joined with other construction • Provide surveillance on arterial 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> • 				
9	Extend Bayfront Expressway to Woodside Road	<ul style="list-style-type: none"> • Keep some traffic off 101 altogether • Provide direct route from Dumbarton to Woodside Road without using 101 • Minimum construction staging/traffic handling issues • Completely separates Route 84 and Route 101 • Provide direct connection from Bayfront Expressway to US-101 without use of Willow Road or University Avenue • Re-designate SR-84 to bypass US-101 	<ul style="list-style-type: none"> • Requires new right-of-way acquisition • Environmental impacts to salt ponds (potential Bay land restoration area) • Poor foundation soils for roadway due to Bay Mud environment • Requires reconstruction of Woodside/101 interchange • May increase traffic on Woodside Road using SR-84 as a cut-through to I-280 • Increase traffic at the Woodside Road interchange at an already critical location on the 	<ul style="list-style-type: none"> • Environmental impacts • Right-of-way 	High	Long	Low	SMTA has already studied this option.

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			US-101 corridor <ul style="list-style-type: none"> Uninterrupted flow between Bayfront Expressway and US-101 may require increased metering to limit effect on US-101 					
	<i>ITS</i> <ul style="list-style-type: none"> Install trailblazers to guide traffic to freeway Install CCTV camera(s) for additional surveillance Install traffic signal interconnect/communications/ vehicle detection infrastructure 	<ul style="list-style-type: none"> Construction costs will be lower if joined with other construction 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> 				
10	Construct direct flyover connection between Bayfront/ Marsh and 101 north of Marsh	<ul style="list-style-type: none"> Improve throughput capacity between Bayfront and 101 North Relatively small construction footprint to provide direct connection (as opposed to using Willow) Maximizes use of existing Bayfront Expressway Provide uninterrupted flow, thereby increasing capacity 	<ul style="list-style-type: none"> Requires some additional right-of-way and some business/building takes Minimal benefit when freeway is at capacity Still routes SR-84 along US-101 for a short segment Improvement results in no perceived reduction in traffic volume, perhaps 	<ul style="list-style-type: none"> Right-of-way Business impacts 	Medium High	Long	Medium	

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		for all travel directions	<ul style="list-style-type: none"> even an increase Uninterrupted flow between Bayfront Expressway and US-101 may require increased metering to limit effect on US-101 					
	<i>ITS</i> <ul style="list-style-type: none"> Install CMS in advance of flyover Install CCTV camera(s) to monitor traffic flow on flyover Install vehicle detection on flyover Install communications infrastructure along flyover 	<ul style="list-style-type: none"> ITS equipment can help manage traffic on flyover and provide traffic info before drivers commit to their route Construction costs will be lower if joined with other construction 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> 				
11	Elevated Direct Connections between Bayfront and 101 along Willow Road corridor <ul style="list-style-type: none"> SEE Improvement number 29 	<ul style="list-style-type: none"> Most direct connection between Dumbarton Bridge and Route 101 Eliminate freeway traffic from going through local community (especially if University connection eliminated) Increase throughput capacity between bridge and freeway Separate commuter traffic from local street traffic Very little additional right-of- 	<ul style="list-style-type: none"> High visual/noise impact to local community Limited access to elevated section Difficult construction staging/traffic handling 	<ul style="list-style-type: none"> Visual impact 	Very high	Long	High	Part of Caltrans study

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		way needed • Provide uninterrupted flow, thereby increasing capacity for all travel directions						
	<i>ITS</i> • Install CMS in advance of flyover • Install CCTV camera(s) to monitor traffic flow on flyover • Install vehicle detection • Install communications infrastructure	• ITS equipment can help manage traffic on flyover and provide traffic info before drivers commit to their route • Construction costs will be lower if joined with other construction •	• ITS elements are the first to be cut from construction projects	•				
12	Elevated roadway along Dumbarton RR corridor between University and 101	• SMCTA owns RR corridor right-of-way • Much of the corridor is adjacent to industrial uses so reduced impact from visual/noise intrusion • Better connection might be made along RR corridor starting at Willow instead of University • Provide uninterrupted flow, thereby increasing capacity for all travel directions	• Corridor would most benefit a 101 North connection but that's already served by Bayfront Expressway • Corridor is "long way around" for a south connection • 101 South connection ramps would cut thru/over a local park and sport fields • Potential for contaminated soils along old RR/industrial corridor requiring cleanup • Elevated roadway over	• Indirect route for desired connection • Operating agreements	Very high	Long	Low	

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			RR would have to be about 8 feet higher then over other roadway due to train clearance requirements <ul style="list-style-type: none"> Limited vehicle access to RR corridor would make construction difficult Elevated roads would add continual traffic noise element to corridor rather then occasional noise of passing train Visual impact to local residents Limited access to elevated section 					
	<i>ITS</i> <ul style="list-style-type: none"> Install CMS in advance of elevated section Install CCTV camera(s) to monitor elevated section Install vehicle detection on elevated section Install communications infrastructure along elevated section 	<ul style="list-style-type: none"> ITS equipment can help manage traffic on elevated section and provide traffic info before drivers commit to their route Construction costs will be lower if joined with other construction 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> 				

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13	New 101 South connection through East Palo Alto (Expressway south of University)	<ul style="list-style-type: none"> Provides new direct route to 101 South – much faster connection than now possible Relieve traffic from University and Willow 	<ul style="list-style-type: none"> Huge visual/noise/quality of life impacts to local residents along new route Acquisition and relocation of many industrial and residential uses needed to obtain necessary right-of-way Disrupts local community connectivity No room for new 101 South connection ramps north of the Embarcadero interchange 	<ul style="list-style-type: none"> Right-of-way relocations and displacements Lack of viable connection point to 101 South Community impacts 	Very high	Long	Low	
	<i>ITS</i> <ul style="list-style-type: none"> Implement BRT and/or TSP Install system detection along route Install arterial CMS for route guidance Install arterial CCTV cameras for surveillance Install trailblazers on arterial for route guidance Install lane control signals Install traffic signal 	<ul style="list-style-type: none"> <i>ITS equipment can help manage traffic on elevated section and provide traffic info before drivers commit to their route</i> <i>Construction costs will be lower if joined with other construction</i> 	<ul style="list-style-type: none"> <i>ITS elements are the first to be cut from construction projects</i> 	<ul style="list-style-type: none"> 				

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	<i>interconnect/communications infrastructure</i>							
14	<p>New 101 South connection skirting East Palo Alto (Expressway/viaduct along edge of bay)</p> <ul style="list-style-type: none"> • Direct connections at Bayfront Expressway (east of University) and Highway 101 (near Embarcadero/Oregon interchange) • Bridges over Hetch-Hetchy pipelines and Dumbarton RR • Skirt Ravenswood Open Space Preserve, Baylands, and Palo Alto Golf Course • 2- 4 lane viaduct, with piers designed to limit environmental impacts • Consider HOV-only or HOT-only usage 	<ul style="list-style-type: none"> • Provides new direct route to 101 South – much faster connection than now possible • Relieve traffic from University and Willow Bypass local community rather than bisect it • Could connect to 101 south of the Embarcadero/Oregon interchange • Minimal construction staging/traffic handling problems • Relocation of residences not required 	<ul style="list-style-type: none"> • Environmental impacts to Bay lands would require substantial mitigation • Requires the greatest length of newly constructed roadway • Requires right-of-way take from businesses and parks at south end • Likely poor foundation soils for roadway due to Bay Mud environment • Some visual/noise impact to outlying residents 	<ul style="list-style-type: none"> • Environmental impacts • Community impacts 	Very high	Long	Low	

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	<i>ITS</i> <ul style="list-style-type: none"> • Install CCTV cameras for surveillance • Install communications infrastructure along route • Install CMS in advance of connection • Install vehicle detection 	<ul style="list-style-type: none"> • ITS equipment can help manage traffic on elevated section and provide traffic info before drivers commit to their route • Construction costs will be lower if joined with other construction 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> • 				
15	Tunnel beneath East Palo Alto <ul style="list-style-type: none"> • University Avenue to Highway 101(near Embarcadero/Oregon interchange) • Beneath Ravenswood Industrial Area and residential neighborhoods south of University 	<ul style="list-style-type: none"> • Fast, direct connection without impact to local community once constructed 	<ul style="list-style-type: none"> • Cut and cover construction would be impractical through existing community • Boring a tunnel beneath the community would be very, very expensive • Poor Bay Mud soil conditions would drive up cost of tunnel structure • Requires elaborate pumping system to keep tunnel drained and dry • right-of-way take required at south portal 	<ul style="list-style-type: none"> • Constructability 	Very high	Long	Low	
	<i>ITS</i> <ul style="list-style-type: none"> • Install lane control signals • Install CCTV 	<ul style="list-style-type: none"> • Lane control signals are beneficial when there is an accident in tunnel • Other ITS elements will help 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> • 				

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	<i>cameras for surveillance</i> <ul style="list-style-type: none"> • <i>Install CMS in advance of tunnel</i> • <i>Install communications and vehicle detection in tunnel</i> 	<i>monitor traffic entering the tunnel</i>						
16	San Francisquito Creek Diversion Structure and Roadway (dual use tunnel facility)	<ul style="list-style-type: none"> • Dual uses improve utility of flood control investment • Grade separated (tunnel) 	<ul style="list-style-type: none"> • Not usable by vehicles during flood events • Requires elaborate access control and pumping systems to keep operational • Connections from existing facilities to diversion/roadway would be challenging 	<ul style="list-style-type: none"> • Operations and maintenance constraints 	High	Long	Low	
	<i>ITS</i> <ul style="list-style-type: none"> • <i>Install lane control signals</i> • <i>Install CCTV cameras for surveillance</i> • <i>Install CMS in advance of facility</i> • <i>Install communications and vehicle detection in facility</i> 	<ul style="list-style-type: none"> • <i>Lane control signals are beneficial when there is an accident in structure</i> • <i>Other ITS elements will help monitor traffic entering the facility</i> • 	<ul style="list-style-type: none"> • <i>ITS elements are the first to be cut from construction projects</i> 	<ul style="list-style-type: none"> • 				
16A	Route 101 flood control project potentially down Willow Road	•	•	•		Long	Low	To prevent flooding on Route 101

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	down Willow Road.							Route 101. Considered as part of auxiliary lane project (see number 1). Review study already done by the San Francisquito Creek JPA.
Willow Road						Implement- ation Horizon	Analyze As Part of 2020 Study	C/CAG Staff Comments
17	Signal Timing during peak travel periods <ul style="list-style-type: none"> Consider adaptive or responsive operation Install vehicle detection 	<ul style="list-style-type: none"> No physical construction (except potential controller upgrades and vehicle detection) Will not disrupt traffic to implement 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief Local traffic will be delayed during peak times May need more left turn storage on Willow at cross-streets 		Very Low	Short	High	Part of Caltrans study
18	Prohibit left turns during peak travel periods	<ul style="list-style-type: none"> Little or no construction required Eliminates a source of delay on Willow during peak times 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief May be difficult to implement Traffic to local streets will be disrupted, driver confusion 		Very Low	Short	High	Part of Caltrans study

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			<ul style="list-style-type: none"> Alternative routes for local traffic 					
	<i>ITS</i> <ul style="list-style-type: none"> Install trailblazers to assist in redirecting traffic from prohibited left turns 	<ul style="list-style-type: none"> Arterial trailblazers will keep drivers from getting on the freeway when severely congested. Trailblazers can help guide drivers on arterials around an incident on the freeway. 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects Trailblazer signs are not used in the Bay Area so there would need to be education as well 					
19	Prohibit local cross traffic during peak travel periods	<ul style="list-style-type: none"> Little or no construction required Eliminates a source of delay on Willow during peak times Should provide some traffic flow improvement during peak times 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief May be difficult to implement Traffic on local streets will be disrupted, driver confusion Alternative routes for local traffic 	<ul style="list-style-type: none"> Local access impacts (no alternate routes) 	Very Low	Short	High	Part of Caltrans study
	<i>ITS</i> <ul style="list-style-type: none"> Install trailblazers to assist in redirecting traffic from prohibited left turns 	<ul style="list-style-type: none"> Arterial trailblazers will keep drivers from getting on the freeway when severely congested. Trailblazers can help guide drivers on arterials around an incident on the freeway. 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects Trailblazer signs are not used in the Bay Area so there would need to be education as well 	<ul style="list-style-type: none"> 				
20	Exit/Entrance Right Turn pockets on Willow	<ul style="list-style-type: none"> Minimal construction impacts Eliminates a source of delay on Willow Should provide some traffic 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief May need to acquire 		Very Low	Medium	High	Part of Caltrans study

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		flow improvement on Willow	right-of-way <ul style="list-style-type: none"> May need to relocate utilities 					
21	Set back curb line one lane width from traveled way at driveways	<ul style="list-style-type: none"> Minimal construction impacts Eliminates a source of delay on Willow Should provide some traffic flow improvement on Willow 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief May need to acquire right-of-way May need to reconfigure parcels and uses May need to relocate utilities 		Low	Medium	High	Part of Caltrans study
22	Eliminate driveway access on Willow	<ul style="list-style-type: none"> Minimal construction impacts Should provide some traffic flow improvement on Willow 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief May disrupt local traffic patterns Local business opposition May need to provide alternative access to local businesses 	<ul style="list-style-type: none"> Local access impacts 	Low	Short	Low	Part of Caltrans study
23	Eliminate selected signalized intersections: <ul style="list-style-type: none"> Newbridge St Ivy Dr Hamilton Ave 	<ul style="list-style-type: none"> Minimal construction impacts Should provide some traffic flow improvement on Willow 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief Confusion for drivers Traffic patterns on local streets will be delayed and/or disrupted May need to establish alternative routes for local streets to access other side of Willow 	<ul style="list-style-type: none"> Increase in collisions 	Low	Short	Medium	Part of Caltrans study

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24	Eliminate signalized intersections and allow right turns only on/off Willow	<ul style="list-style-type: none"> Minimal construction impacts Allows for access of local traffic to/from Willow Effectively converts Willow to an expressway 	<ul style="list-style-type: none"> Local traffic patterns will be disrupted Confusion for drivers Traffic patterns on local streets will be delayed and/or disrupted Establish alternative routes for local streets to access other side of Willow 	<ul style="list-style-type: none"> Local circulation impacts 	Low	Short	Low	Part of Caltrans study
25	Eliminate signalized intersections and prohibit any access from local streets	<ul style="list-style-type: none"> Low cost and Minimal construction required Eliminates the usual sources of delay Effectively converts Willow to an expressway 	<ul style="list-style-type: none"> Local traffic patterns will be disrupted Traffic on local streets will be delayed Will need to establish alternative routes for local traffic to access Willow and other side of Willow 	<ul style="list-style-type: none"> Local circulation impacts 	Low	Short	Low	Part of Caltrans study
26	Widen Willow one lane each direction	<ul style="list-style-type: none"> Adds capacity Maintains local street access Should provide some traffic flow improvement on Willow 	<ul style="list-style-type: none"> May not achieve desired level of congestion relief Major disruption from construction activities Will require right-of-way and utility relocation Would require modification of Menlo Park's flood control project 	<ul style="list-style-type: none"> Right-of-way 	High	Medium	Medium	Part of Caltrans study

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	<i>ITS</i> <ul style="list-style-type: none"> Install, upgrade or replace traffic signal interconnect/communications / vehicle detection infrastructure 	<ul style="list-style-type: none"> ITS construction costs will be much lower if done in conjunction with other construction 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> 				
27	Grade separations at selected intersections: <ul style="list-style-type: none"> Newbridge St Ivy Dr Hamilton Ave 	<ul style="list-style-type: none"> Increases Willow capacity Preserves local traffic patterns Congestion relief 	<ul style="list-style-type: none"> Profile grades and clearances may be difficult to achieve given spacing of subject and intermediate intersections May require local street closures Major disruption from construction activities Will require significant right-of-way acquisition and utility relocation May be some aesthetic issues 	<ul style="list-style-type: none"> Right-of-way Spacing versus clearances 	Very High	Long	High	Part of Caltrans study
	<i>ITS</i> <ul style="list-style-type: none"> Install communications infrastructure in bridge structures 	<ul style="list-style-type: none"> ITS construction costs will be much lower if done in conjunction with other construction Not an eyesore if conduit is installed inside bridge structure 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 					

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
28	Pedestrian over crossing at Ivy Dr (near Mid-Peninsula High School)	<ul style="list-style-type: none"> Eliminates a source of delay on Willow Should provide some traffic flow improvements on Willow Provides pedestrians a safer crossing of Willow Provides safer access for students walking to the school 	<ul style="list-style-type: none"> May only provide minimal congestion relief Some disruption from construction activities May be some aesthetic issues May need to acquire some right-of-way and relocate utilities 	<ul style="list-style-type: none"> Visual impact 	Medium	Medium	High	Part of Caltrans study
29a	Elevated viaduct expressway structure <ul style="list-style-type: none"> 2 lanes in each direction 	<ul style="list-style-type: none"> Provides a freeway-type connection between US 101 and Rte 84 Preserves local traffic patterns Congestion relief 	<ul style="list-style-type: none"> Major disruption from construction activities May need to acquire some right-of-way and relocation of utilities May be some aesthetic issues Significant community impact (may create barrier) 	<ul style="list-style-type: none"> Community impacts 	Very high	Long	High	Part of Caltrans study
29b	Elevated viaduct expressway structure <ul style="list-style-type: none"> 1 lane in each direction 	<ul style="list-style-type: none"> Provides a freeway-type connection between US 101 and Rte 84 Preserves local traffic patterns Congestion relief Less deck width required 	<ul style="list-style-type: none"> Major disruption from construction activities May need relocation of utilities Capacity will be less than multi-lane option May be some aesthetic issues Significant community impact 	<ul style="list-style-type: none"> Community impacts 	Very high	Long	High	Part of Caltrans study

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
29c	Elevated viaduct expressway structure <ul style="list-style-type: none"> Reversible 2 lanes 	<ul style="list-style-type: none"> Provides a freeway-type connection between US 101 and Rte 84 Preserves local traffic patterns Congestion relief 2-lanes are optimized for peak traffic Less deck width required 	<ul style="list-style-type: none"> Major disruption from construction activities Reversible lane control required Maintenance & operation cost for lane control May need relocation of utilities May be some aesthetic issues Significant community impact 	<ul style="list-style-type: none"> Community impacts 	Very high	Long	High	Part of Caltrans study
29d	Elevated viaduct expressway structure <ul style="list-style-type: none"> 3 lanes with reversible middle lane 	<ul style="list-style-type: none"> Provides a freeway-type connection between US 101 and Rte 84 Preserves local traffic patterns Congestion relief 3-lanes optimized for peak traffic Less deck width required 	<ul style="list-style-type: none"> Major disruption from construction activities Reversible lane control required Maintenance & operation cost for lane control May need relocation of utilities May be some aesthetic issues Significant community impact 	<ul style="list-style-type: none"> Community impacts 	Very high	Long	High	Part of Caltrans study
	ITS <ul style="list-style-type: none"> Install lane control signals Install CCTV cameras for surveillance 	<ul style="list-style-type: none"> Lane control signals are beneficial when there is an accident Other ITS elements will help monitor traffic in this section 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> 				

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	<ul style="list-style-type: none"> • Install communications / vehicle detection infrastructure on viaduct • Install arterial CMS in advance of viaduct in each direction 							
30a	Depressed expressway: <ul style="list-style-type: none"> • 2 lanes each direction 	<ul style="list-style-type: none"> • Provides an expressway connecting US 101 and Rte 84 • Preserves local traffic patterns • Congestion relief • Less visual/noise impacts and perceived community separation than elevated roadway 	<ul style="list-style-type: none"> • Major disruption from construction activities • Will need to acquire significant right-of-way and relocation of utilities • Maintenance & Operation costs for pumping facilities • May be some aesthetic issues • Geotechnical conditions 	<ul style="list-style-type: none"> • Community impacts • Constructability • Right-of-way 	Very high	Long	High	Part of Caltrans study
30b	Depressed expressway: <ul style="list-style-type: none"> • 1 lane each direction 	<ul style="list-style-type: none"> • Provides an expressway connecting US 101 and Rte 84 • Preserves local traffic patterns • Less excavation required • Congestion relief 	<ul style="list-style-type: none"> • Major disruption from construction activities • Will need to acquire significant right-of-way and utility relocation • Capacity will be less than multi-lane option • May be some aesthetic issues • Geotechnical conditions 	<ul style="list-style-type: none"> • Community impacts • Constructability • Right-of-way 	Very high	Long	High	Part of Caltrans study

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
30c	Depressed expressway: • Reversible 2 lanes	<ul style="list-style-type: none"> • Provides an expressway connecting US 101 and Rte 84 • Preserves local traffic patterns • Congestion relief • 2-lanes are optimized for peak traffic • Less excavation is required 	<ul style="list-style-type: none"> • Major disruption from construction activities • Reversible lane control required • Maintenance & operation cost for lane control and pumping facilities • Will need to acquire significant right-of-way and utility relocation • May be some aesthetic issues • Geotechnical conditions • 	<ul style="list-style-type: none"> • Community impacts • Constructability • Right-of-way 	Very high	Long	High	Part of Caltrans study
30d	Depressed expressway: • 3 lanes with reversible middle lane	<ul style="list-style-type: none"> • Provides an expressway connecting US 101 and Rte 84 • Preserves local traffic patterns • Congestion relief • 3-lanes optimized for peak traffic • Less excavation is required 	<ul style="list-style-type: none"> • Major disruption from construction activities • Reversible lane control required • Maintenance & operation cost for lane control • Maintenance & Operation costs for pumping facilities • Will need to acquire significant right-of-way and utility relocation • Geotechnical conditions • 	<ul style="list-style-type: none"> • Community impacts • Constructability • Right-of-way 	Very high	Long	High	Part of Caltrans study

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	ITS <ul style="list-style-type: none"> • Install lane control signals • Install CCTV cameras for surveillance • Install communications and vehicle detection infrastructure • Install arterial CMS in advance of facility in each direction 	<ul style="list-style-type: none"> • Lane control signals are beneficial when there is an accident • Other ITS elements will help monitor traffic in this section 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> • 				
31	Grade separations at all intersections (over crossings or under crossings)	<ul style="list-style-type: none"> • Eliminates a source of delay on Willow • Avoids converting Willow entirely into an expressway • Should provide some traffic flow improvements on Willow Road 	<ul style="list-style-type: none"> • May not achieve desired level of congestion relief • Profile grades and clearances may be difficult to achieve given spacing of intersections • May require local street closures • Major disruption from construction activities • May be some aesthetic issues 	<ul style="list-style-type: none"> • Community impacts • Constructability • Right-of-way 	Very high	Long	High	Part of Caltrans study
	ITS <ul style="list-style-type: none"> • Install communications infrastructure in bridge structures 	<ul style="list-style-type: none"> • ITS construction costs will be much lower if done in conjunction with other construction • Not an eyesore if conduit is installed inside bridge 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> • 				

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
		<ul style="list-style-type: none"> • structure 						
32	Tunnel Expressway (maintain existing facility at grade)	<ul style="list-style-type: none"> • Provides an expressway connecting US 101 and Rte 84 • Preserves local traffic patterns • Congestion relief 	<ul style="list-style-type: none"> • Utility relocation • Geotechnical conditions 		Very high	Long	High	Part of Caltrans study
	ITS <ul style="list-style-type: none"> • Install lane control signals • Install CCTV cameras for surveillance • Install communications and vehicle detection infrastructure in tunnel • Install arterial CMS in advance of tunnel in each direction 	<ul style="list-style-type: none"> • Lane control signals are beneficial when there is an accident in tunnel • Other ITS elements will help monitor traffic entering the tunnel • 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects 					
33	Modified depressed Expressway (surface frontage roads cantilevered inboard to minimize frontage impacts)	<ul style="list-style-type: none"> • Provides an expressway connecting US 101 and Rte 84 • Preserves local traffic patterns • Congestion relief 	<ul style="list-style-type: none"> • Complex structural design • Utility relocation • Geotechnical conditions 		Very high	Long	High	Part of Caltrans study

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	ITS <ul style="list-style-type: none"> • Install lane control signals • Install CCTV cameras for surveillance • Install communications and vehicle detection infrastructure • Install arterial CMS in advance of facility in each direction 	<ul style="list-style-type: none"> • Lane control signals are beneficial when there is an accident • Other ITS elements will help monitor traffic in this section • 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects 	<ul style="list-style-type: none"> • 				
University Avenue						Implementation Horizon	Analyze As Part of 2020 Study	C/CAG Staff Comments
34	Signal Timing during peak travel periods <ul style="list-style-type: none"> • Consider adaptive or responsive operation • Install vehicle detection 	<ul style="list-style-type: none"> • Improves through traffic flow • No physical construction(except potential controller upgrades and vehicle detection) • Will not disrupt traffic to implement 	<ul style="list-style-type: none"> • Likely will not achieve desired level of congestion relief • Local traffic will be delayed during peak times • May need more left turn storage on University at cross-streets 		Very low	Short	High	
35	Prohibit left turns during peak travel periods	<ul style="list-style-type: none"> • Little or no construction required • Eliminates a source of delay on University during peak times 	<ul style="list-style-type: none"> • Likely will not achieve desired level of congestion relief • May be difficult to implement • Traffic to local streets will 		Very low	Short	Low	

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
			<ul style="list-style-type: none"> be disrupted, driver confusion Alternative routes for local traffic 					
	<i>ITS</i> <ul style="list-style-type: none"> Install trailblazers to assist in redirecting traffic from prohibited left turns 	<ul style="list-style-type: none"> Arterial trailblazers will keep drivers from getting on the freeway when severely congested. Trailblazers can help guide drivers on arterials around an incident on the freeway. 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects Trailblazer signs are not used in the Bay Area so there would need to be education as well 					
36	Prohibit local cross traffic during peak travel periods	<ul style="list-style-type: none"> Little or no construction required Eliminates a source of delay on University during peak times Should provide some traffic flow improvement during peak times 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief May be difficult to implement Traffic on local streets will be disrupted, driver confusion Alternative routes for local traffic 	<ul style="list-style-type: none"> Local access impacts (no alternate routes) 	Very low	Short	Low	
	<i>ITS</i> <ul style="list-style-type: none"> Install trailblazers to assist in redirecting traffic from prohibited left turns 	<ul style="list-style-type: none"> Arterial trailblazers will keep drivers from getting on the freeway when severely congested. Trailblazers can help guide drivers on arterials around an incident on the freeway. 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects Trailblazer signs are not used in the Bay Area so there would need to be education as well 	<ul style="list-style-type: none"> 				
37	Entrance/Exit Right Turn pockets on University	<ul style="list-style-type: none"> Minimal construction impacts Eliminates a source of delay 	<ul style="list-style-type: none"> Likely will not achieve desired level of 		Low	Short	Medium	Refer idea to EPA for further

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	University	<ul style="list-style-type: none"> on University Should provide some traffic flow improvement on University 	<ul style="list-style-type: none"> congestion relief May need to acquire right-of-way May need to relocate utilities 					further consideration.
38	Set back curb line one lane width from traveled way at driveways	<ul style="list-style-type: none"> Minimal construction impacts Eliminates a source of delay on University Should provide some traffic flow improvement on University Improves safety 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief May need to acquire right-of-way May need to reconfigure parcels and uses May need to relocate utilities 		Low	Medium	Low	
39	Eliminate driveway access on University	<ul style="list-style-type: none"> Minimal construction impacts Should provide some traffic flow improvement on University 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief May disrupt local traffic patterns Local business opposition May need to provide alternative access to local businesses (i.e. frontage road, which would require significant right-of-way takes and relocations) 	<ul style="list-style-type: none"> Right-of-way Local access impacts 	Medium	Short	Low	
40	Eliminate selected signalized intersections: <ul style="list-style-type: none"> Bell Runnymede 	<ul style="list-style-type: none"> Minimal construction impacts Should provide some traffic flow improvement on University 	<ul style="list-style-type: none"> Likely will not achieve desired level of congestion relief Confusion for drivers Traffic patterns on local 		Low	Short	Low	

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	<ul style="list-style-type: none"> Kavanaugh 		streets will be delayed and/or disrupted <ul style="list-style-type: none"> May need to establish alternative routes for local streets to access other side of University 					
41	Eliminate signalized intersections and allow right turns only on/off University	<ul style="list-style-type: none"> Minimal construction impacts Allows for access of local traffic to/from University Effectively converts University to an expressway 	<ul style="list-style-type: none"> Local traffic patterns will be disrupted Confusion for drivers Traffic patterns on local streets will be delayed and/or disrupted Establish alternative routes for local streets to access other side of University 	<ul style="list-style-type: none"> Local circulation impacts 	Low	Short	Low	
42	Eliminate signalized intersections and prohibit any access from local streets	<ul style="list-style-type: none"> Low cost and Minimal construction required Eliminates the usual sources of delay Effectively converts University to an expressway 	<ul style="list-style-type: none"> Local traffic patterns will be disrupted Traffic on local streets will be delayed Will need to establish alternative routes for local traffic to access University and other side of University 	<ul style="list-style-type: none"> Local circulation impacts 	Low	Short	Low	
43	Widen University one lane each direction	<ul style="list-style-type: none"> Adds capacity Maintains local street access Should provide some traffic flow improvement on University 	<ul style="list-style-type: none"> May not achieve desired level of congestion relief Major disruption from construction activities Utility relocation Requires significant right-of-way take and likely 	<ul style="list-style-type: none"> Right-of-way and relocations 	High	High	Low	

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
			many residence/business relocations <ul style="list-style-type: none"> • Further disrupts local sense of community by adding more traffic and wider separation between sides 					
	<i>ITS</i> <ul style="list-style-type: none"> • Install, upgrade or replace traffic signal interconnect/communications /vehicle detection infrastructure 	<ul style="list-style-type: none"> • ITS construction costs will be much lower if done in conjunction with other construction 						
44	Grade separations at selected intersections: <ul style="list-style-type: none"> • Donohoe • Bay 	<ul style="list-style-type: none"> • Increases University capacity • Preserves local traffic patterns • Congestion relief 	<ul style="list-style-type: none"> • Requires right-of-way take from local properties • Profile grades and clearances may be difficult to achieve given spacing of subject and intermediate intersections • May require local street closures • Requires utility relocations • Construction staging/traffic handling of over crossings would be difficult since Donohoe and Bay are fairly narrow streets 	<ul style="list-style-type: none"> • Right-of-way • Spacing versus clearances 	High	Long	Low	

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	<i>ITS</i> <ul style="list-style-type: none"> Install communications infrastructure in bridge structures 	<ul style="list-style-type: none"> ITS construction costs will be much lower if done in conjunction with other construction Not an eyesore if conduit is installed inside bridge structure 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 					
45a	Elevated expressway/viaduct along University corridor <ul style="list-style-type: none"> 2 lanes each direction 	<ul style="list-style-type: none"> Provides a freeway-type connection between US 101 and Rte 84 Preserves local traffic patterns Congestion relief 	<ul style="list-style-type: none"> Major disruption from construction activities May need to acquire some right-of-way and relocation of utilities May be some aesthetic issues Significant community impact (may create barrier) 	<ul style="list-style-type: none"> Community impacts 	Very high	Long	Low	
45b	Elevated viaduct expressway structure <ul style="list-style-type: none"> 1 lane in each direction 	<ul style="list-style-type: none"> Provides a freeway-type connection between US 101 and Rte 84 Preserves local traffic patterns Congestion relief Less deck width required 	<ul style="list-style-type: none"> Major disruption from construction activities May need relocation of utilities Capacity will be less than multi-lane option May be some aesthetic issues Significant community impact 	<ul style="list-style-type: none"> Community impacts 	Very high	Long	Low	

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
45c	Elevated viaduct expressway structure <ul style="list-style-type: none"> • Reversible 2 lanes 	<ul style="list-style-type: none"> • Provides a freeway-type connection between US 101 and Rte 84 • Preserves local traffic patterns • Congestion relief • 2-lanes are optimized for peak traffic • Less deck width required 	<ul style="list-style-type: none"> • Major disruption from construction activities • Reversible lane control required • Maintenance & operation cost for lane control • May need relocation of utilities • May be some aesthetic issues • Significant community impact 	<ul style="list-style-type: none"> • Community impacts 	Very high	Long	Low	
45d	Elevated viaduct expressway structure <ul style="list-style-type: none"> • 3 lanes with reversible middle lane 	<ul style="list-style-type: none"> • Provides a freeway-type connection between US 101 and Rte 84 • Preserves local traffic patterns • Congestion relief • 3-lanes optimized for peak traffic • Less deck width required 	<ul style="list-style-type: none"> • Major disruption from construction activities • Reversible lane control required • Maintenance & operation cost for lane control • May need relocation of utilities • May be some aesthetic issues • Significant community impact 	<ul style="list-style-type: none"> • Community impacts 	Very high	Long	Low	
	<i>ITS</i> <ul style="list-style-type: none"> • Install lane control signals • Install CCTV cameras for surveillance 	<ul style="list-style-type: none"> • Lane control signals are beneficial when there is an accident • Other ITS elements will help monitor traffic in this section • 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects 					

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	<ul style="list-style-type: none"> • Install communications and vehicle detection infrastructure on viaduct • Install arterial CMS in advance of viaduct in each direction 							
46a	Depressed expressway: <ul style="list-style-type: none"> • 2 lanes each direction 	<ul style="list-style-type: none"> • Provides an expressway connecting US 101 and Rte 84 • Preserves local traffic patterns • Congestion relief • Less visual/noise impacts and perceived community separation than elevated roadway 	<ul style="list-style-type: none"> • Major disruption from construction activities • Will need to acquire significant right-of-way and relocation of utilities • Maintenance & Operation costs for pumping facilities • May be some aesthetic issues • Geotechnical conditions 	<ul style="list-style-type: none"> • Community impacts • Constructability • Right-of-way 	Very High	Long	High	
46b	Depressed expressway: <ul style="list-style-type: none"> • 1 lane each direction 	<ul style="list-style-type: none"> • Provides an expressway connecting US 101 and Rte 84 • Preserves local traffic patterns • Less excavation required • Congestion relief 	<ul style="list-style-type: none"> • Major disruption from construction activities • Will need to acquire significant right-of-way and utility relocation • Capacity will be less than multi-lane option • May be some aesthetic issues • Geotechnical conditions 	<ul style="list-style-type: none"> • Community impacts • Constructability • Right-of-way 	Very high	Long	High	

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
46c	Depressed expressway: <ul style="list-style-type: none"> Reversible 2 lanes 	<ul style="list-style-type: none"> Provides an expressway connecting US 101 and Rte 84 Preserves local traffic patterns Congestion relief 2-lanes are optimized for peak traffic Less excavation is required 	<ul style="list-style-type: none"> Major disruption from construction activities Reversible lane control required Maintenance & operation cost for lane control and pumping facilities Will need to acquire significant right-of-way and utility relocation May be some aesthetic issues Geotechnical conditions 	<ul style="list-style-type: none"> Community impacts Constructability Right-of-way 	Very high	Long	High	
46d	Depressed expressway: <ul style="list-style-type: none"> 3 lanes with reversible middle lane 	<ul style="list-style-type: none"> Provides an expressway connecting US 101 and Rte 84 Preserves local traffic patterns Congestion relief 3-lanes optimized for peak traffic Less excavation is required 	<ul style="list-style-type: none"> Major disruption from construction activities Reversible lane control required Maintenance & operation cost for lane control Maintenance & Operation costs for pumping facilities Will need to acquire significant right-of-way and utility relocation Geotechnical conditions 	<ul style="list-style-type: none"> Community impacts Constructability Right-of-way 	Very high	Long	High	
	ITS <ul style="list-style-type: none"> Install lane control signals 	<ul style="list-style-type: none"> Lane control signals are beneficial when there is an accident 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 					

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	<ul style="list-style-type: none"> • Install CCTV cameras for surveillance • Install communications and vehicle detection infrastructure • Install arterial CMS in advance of facility in each direction 	<ul style="list-style-type: none"> • Other ITS elements will help monitor traffic in this section • 						
47	Grade separations at all intersections (over crossings or under crossings)	<ul style="list-style-type: none"> • Eliminates a source of delay on University • Avoids converting University entirely into an expressway • Should provide some traffic flow improvements on University 	<ul style="list-style-type: none"> • May not achieve desired level of congestion relief • Profile grades and clearances may be difficult to achieve given spacing of subject and intermediate intersections • May require local street closures • Requires right-of-way acquisition and utilities relocation • Major disruption from construction activities • May be some aesthetic issues 	<ul style="list-style-type: none"> • Community impacts • Constructability • Right-of-way 	Very high	Long	Low	
	<i>ITS</i> <ul style="list-style-type: none"> • Install communications infrastructure in bridge structures 	<ul style="list-style-type: none"> • ITS construction costs will be much lower if done in conjunction with other construction • Not an eyesore if conduit is installed inside bridge 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects 					

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
		<i>structure</i>						
48	Tunnel Expressway, (maintain existing facility at grade)	<ul style="list-style-type: none"> Provides an expressway connecting US 101 and Rte 84 Preserves local traffic patterns Congestion relief 	<ul style="list-style-type: none"> Utility relocation Geotechnical conditions 		Very high	Long	Low	
	<i>ITS</i> <ul style="list-style-type: none"> Install lane control signals Install CCTV cameras for surveillance Install communications and vehicle detection infrastructure in tunnel Install arterial CMS in advance of tunnel in each direction 	<ul style="list-style-type: none"> Lane control signals are beneficial when there is an accident in tunnel Other ITS elements will help monitor traffic entering the tunnel 	<ul style="list-style-type: none"> ITS elements are the first to be cut from construction projects 					
49	Modified depressed Expressway (surface frontage roads cantilevered inboard to minimize frontage impacts)	<ul style="list-style-type: none"> Provides an expressway connecting US 101 and Rte 84 Preserves local traffic patterns Congestion relief 	<ul style="list-style-type: none"> Complex structural design Utility relocation Geotechnical conditions 		Very high	Long	High	

DRAFT LIST OF IMPROVEMENT ALTERNATIVES IN THE 2020 PENINSULA GATEWAY CORRIDOR								
Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	ITS <ul style="list-style-type: none"> • Install lane control signals • Install CCTV cameras for surveillance • Install communications and vehicle detection infrastructure • Install arterial CMS in advance of facility in each direction 	<ul style="list-style-type: none"> • Lane control signals are beneficial when there is an accident • Other ITS elements will help monitor traffic in this section • 	<ul style="list-style-type: none"> • ITS elements are the first to be cut from construction projects 					
Complementary ITS Elements (to be included in project definitions as appropriate)						Implement- ation Horizon	Analyze As Part of 2020 Study	C/CAG Staff Comments
50	Install traffic signal interconnect/communications infrastructure between Middlefield Road and 101	<ul style="list-style-type: none"> • Enhance local management and monitoring of traffic 				Short	High	
51	Install transit signal priority to support high-patronage bus routes.	<ul style="list-style-type: none"> • Enhances bus travel speed, increased ridership 				Short	High	
52	Install trailblazers and/or arterial CMS to provide route guidance information	<ul style="list-style-type: none"> • Increases amount of information available to drivers 				Short	High	
53	Prepare Incident Management and Traveler Information	<ul style="list-style-type: none"> • Identifies objectives, elements, and implementation strategy 				Short	Medium	Consider joint ITS project with VTA.

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Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	<i>Plan for Corridor</i>							
Other Potential Improvements Noted by Public and Others						Implement- ation Horizon	Analyze As Part of 2020 Study	C/CAG Staff Comments
54	<p>Study the possible designation of East Bayshore (San Antonio to University) as a reliever route to provide congestion relief and for incident management on Route 101</p> <ul style="list-style-type: none"> Improve operations at intersections Install directional signage to help keep commuters off residential streets 	<ul style="list-style-type: none"> Potential element of corridor incident management program Limited physical construction Limited right-of-way or access impacts 	<ul style="list-style-type: none"> May increase commuter cut-through traffic 			Short	High	
	<p>ITS</p> <ul style="list-style-type: none"> Install trailblazers and/or arterial CMS to provide route guidance information 	<ul style="list-style-type: none"> Increases amount of information available to drivers 	<ul style="list-style-type: none"> 					
55	<p>Improve 101/University interchange</p> <ul style="list-style-type: none"> Construct 	<ul style="list-style-type: none"> Improve traffic operations Increase capacity of interchange/relieve local 	<ul style="list-style-type: none"> No increase in corridor capacity Limited right-of-way 	<ul style="list-style-type: none"> Right-of-way 	Medium	Long	High	Southbound off ramp is a planned "phase 2"

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Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	southbound direct-connect off-ramp • Improve on-off connections for northbound traffic	street congestion	• May require design exceptions (or added right-of-way)					"phase 2" feature.
	ITS • Consider arterial CMS to provide freeway traffic flow info • Consider trailblazers on arterial to redirect traffic during incidents • Install CCTV camera(s) on arterial • Install communications infrastructure in bridge structure (make use of spare conduits, if any) • Replace, upgrade, or install vehicle detection	• Provides camera coverage on arterial • Construction costs will be lower if joined with other construction • Arterial guide signs will keep drivers from getting on the freeway where severely congested. Trailblazers can help guide drivers on arterials around an incident on the freeway. •	• ITS elements are the first to be cut from construction projects • Trailblazer signs are not used in the Bay Area so there would need to be education as well	•				
56	Define residential traffic management elements that complement high priority capital	• Defines in conceptual terms the necessary changes to residential streets directly affected by potential improvements	•	•	Low	Short	High	

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Potential Improvements		Pros	Cons	Potential Fatal Flaws	Relative Cost Meter			
	improvements							